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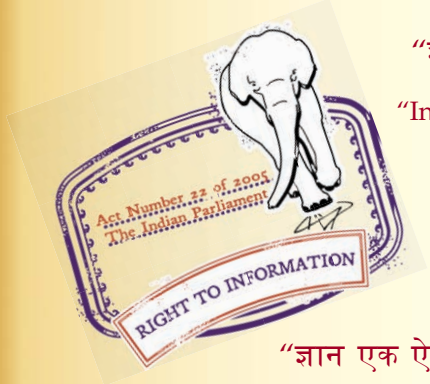

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Indian Standard

SPECIFICATION FOR COPPER CARBONATE

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 5·00

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Indian Standard

SPECIFICATION FOR COPPER CARBONATE

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Indian Standard

SPECIFICATION FOR COPPER CARBONATE

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 24 February 1982, after the draft finalized by the Inorganic Chemicals (Misc) Sectional Committee had been approved by the Chemical Division Council.

0.2 Copper carbonate is a basic salt used in the manufacture of phthalocyanine dyes, pigments, pyrotechnics, insecticides, colouring brass black, astringent in pomade—preparation, copper salts preparation, as an antidote for phosphorus poisioning, and fungicide.

0.3 The use of copper carbonate is more convenient because of its high copper content and its case reaction as it is a basic compound.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS:2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for copper carbonate.

2. REQUIREMENTS

2.1 Description — The material shall be in the form of bright green homogeneous powder or in such form that it is possible to easily powder it under a knife without a grinding action. It shall be free from foreign matter.

2.2 The material, when tested as prescribed in Appendix A, shall also comply with the requirements given in Table 1. Reference to relevant clauses of Appendix A is given in col 4 of the table.

*Rules for rounding off numerical values (*revised*).

TABLE 1 REQUIREMENTS FOR COPPER CARBONATE

(*Clause* 2.2)

Sl No.	Characteristic	Requirement	Method of Test Ref to Cl No. in Appendix A
(1)	(2)	(3)	(4)
i)	Copper (as Cu), percent by mass, *Min*	52·0	A-1
ii)	Chlorides (as Cl), percent by mass, *Max*	0·2	A-2
iii)	Sulphates (as SO_4), percent by mass, *Max*	To pass test	A-3
iv)	Iron content (as Fe), percent by mass, *Max*	0·2	A-4
v)	Insolubles in acid, percent by mass, *Max*	0·5	A-5

3. PACKING AND MARKING

3.1 Packing — The material shall be packed in well closed plastic or glass containers so as to avoid its contact with air. When supplied in bulk, the material may be packed in jute bags with polyethylene liner securely closed.

3.1.1 The material, when used as a pesticide, shall also comply, with the packing requirements as specified in IS : 8190 (Part I)-1976* under the Insecticides Act, 1968.

3.2 Marking — The packages shall be securely closed and bear legibly and indelibly the following information:

a) Name of the material,

b) Name of the manufacturer and his recognized trade-mark, if any,

c) Gross and net mass,

d) Date of manufacture, and

e) Batch number.

*Requirements for packing of pesticides: Part I Solid pesticides.

3.2.1 The packages may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4. SAMPLING

4.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix B.

APPENDIX A

(*Clause* 2.2)

METHODS OF TEST FOR COPPER CARBONATE

A-0. QUALITY OF REAGENTS

A-0.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977*) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-1. COPPER

A-1.1 Reagents

A-1.1.1 *Nitric Acid* (*1 : 4*).

A-1.1.2 *Urea* — solid.

A-1.1.3 *Sodium Carbonate* — powder.

A-1.1.4 *Acetic Acid, Glacial* — A.R.

A-1.1.5 *Ammonium Bifluoride* — solid.

A-1.1.6 *Potassium Iodide Solution* — 20 percent (*m/v*).

*Specification for water for general laboratory use (*second revision*).

A-1.1.7 *Standard Sodium Thiosulphate Solution* — 0·1 N.

A-1.1.8 *Starch Indicator Solution* — 1 percent (*m/v*), freshly prepared.

A-1.2 Procedure — Weigh 2 to 2·5 g of sample and place it in a 150-ml beaker. Add 60 ml of 1 : 4 nitric acid and heat until dissolved. Transfer to a 250-ml volumetric flask, cool and dilute to volume with water. Pipette out 25 ml solution to 125-ml Erlenmeyer flask and add 1 g of urea. Heat to boiling, cool and add sodium carbonate solution until a faint precipitate appears. Then add glacial acetic acid to just redissolve it. Add 1 to 3 g of ammonium bifluoride, depending upon the iron content of the sample. Add 10 ml of 20 percent potassium iodide solution and titrate immediately with 0·1 N sodium thiosulphate solution to a pale straw colour. Add 2 ml of starch indicator and continue titration until the blue colour is just discharged.

A-1.3 Calculation

$$\text{Copper, percent by mass} = \frac{V \times N \times 6{\cdot}35}{M}$$

where

V = volume in ml of the standard sodium thiosulphate solution,

N = normality of standard sodium thiosulphate solution, and

M = mass in g of the material taken for the test.

A-2. CHLORIDES

A-2.1 Reagents

A-2.1.1 *Nitric Acid* — 30 percent (*m/v*).

A-2.1.2 *Silver Nitrate Solution* — 0·1 N.

A-2.2 Procedure — Weigh accurately about 25 g of the material. Add 100 ml of water and heat to boil. Filter and add 1 ml of nitric acid to the filtrate taken in a 250-ml beaker and 1 ml of silver nitrate solution. Heat the beaker to coagulate the precipitate. Make certain that all the chloride is precipitated by adding few drops of silver nitrate solution to the supernatant solution of the filtrate. Keep the precipitate in dark for one hour. Filter the precipitate and wash with nitric acid. Dry the precipitate at 130 to 150°C. Cool and weigh to constant mass.

A-2.3 Calculation

$$\text{Chloride, percent by mass} = \frac{m \times 24{\cdot}7}{M}$$

where

m = mass in g of the precipitate, and

M = mass in g of the material taken for the test.

A-3. SULPHATES

A-3.1 Reagents

A-3.1.1 *Hydrochloric Acid — see* IS : 265-1976*.

A-3.1.2 *Barium Chloride Solution* — 10 percent (*m/v*).

A-3.2 Procedure — Weigh about 10 g of the material accurately. Add 100 ml of water and heat to boil and filter. Add 5 ml of hydrochloric acid to the filtrate taken in 150-ml beaker. Slowly add dropwise 1 ml of barium chloride solution. To pass the test, the precipitate shall not be more than just milkiness.

A-4. IRON CONTENT

A-4.1 Reagents

A-4.1.1 *Nitric Acid — see* IS : 264-1976†.

A-4.1.2 *Hydrochloric Acid — see* IS : 265-1976*.

A-4.1.3 *Ammonia*

A-4.1.4 *Ammonium Chloride*

A-4.2 Procedure — Weigh accurately about 10 g of the material and dissolve it in 10 ml nitric acid and 100 ml of water by heating. Precipitate iron by adding 15 to 20 ml of ammonia and heat to boil and filter. Dissolve the residue in 10 ml of hydrochloric acid and 50 ml of water taken in a beaker. Add 5 g of ammonium chloride and stir to dissolve. Add 20 ml of ammonia, boil, cool, filter. Wash the precipitate with water, dry the residue, ignite, and weigh to constant mass.

A-4.3 Calculation

$$\text{Iron content, percent by mass} = \frac{M_1 \times 70}{M_2}$$

where

M_1 = mass in g of the residue, and

M_2 = mass in g of the material taken for the test.

A-5. INSOLUBLES IN ACID

A-5.1 Reagents

A-5.1.1 *Sulphuric Acid* — 20 percent (*m/v*).

*Specification for hydrochloric acid (*second revision*).

†Specification for nitric acid (*second revision*).

A-5.2 Procedure — Weigh accurately about 10 g of the material and dissolve in 100 ml of sulphuric acid. Heat to boil, cool to room temperature. Filter through tared sintered glass crucible. Wash the residue with hot water till precipitate is free from acid. Dry the crucible at 105 to 110°C and weigh to constant mass.

A-5.3 Calculation

$$\text{Insolubles in acid, percent by mass} = \frac{M_1 \times 100}{M_2}$$

where

M_1 = mass in g of the residue, and

M_2 = mass in g of the material taken for the test.

APPENDIX B

(*Clause* 4.1)

SAMPLING OF COPPER CARBONATE

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

B-1.1 Precaution shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

B-1.2 To draw a representative sample, the contents of each container selected for sampling shall be mixed as thoroughly as possible by suitable means.

B-1.3 The sample shall be placed in suitable, clean, dry and air-tight glass or other suitable containers on which the material has no action.

B-1.4 Each sample container shall be sealed air-tight after filling and marked with full details of sampling, the date of sampling and the year of manufacture of the material.

B-2. SCALE OF SAMPLING

B-2.1 Lot — All the containers in a single consignment of the material and drawn from a single batch of manufacture shall constitute a lot. If a

consignment is declared or known to consist of different batches of manufacture, the containers belonging to the same batch shall be grouped together and each such group shall constitute a separate lot.

B-2.1.1 Samples shall be tested from each lot for ascertaining conformity of the material to the requirements of the specification.

B-2.2 The number (n) of containers to be chosen from a lot shall depend on the size of the lot (N) and shall be in accordance with col 1 and 2 of Table 2.

TABLE 2 NUMBER OF CONTAINERS TO BE SELECTED

Lot Size (N)	Number of Containers to be Selected (n)
3 to 50	3
51 „ 200	4
201 „ 400	5
401 „ 650	6
651 and above	7

B-2.3 The containers to be selected for sampling shall be chosen at random from the lot and for this purpose random number tables shall bs used. In case such tables are not available, the following procedure my be adopted:

Starting from any container, count them 1, 2, 3....., up to r and so on in a systematic manner, where r is the integral part of N/n. Every rth container thus counted shall be taken out for drawing samples.

B-3. TEST SAMPLES AND REFEREE SAMPLE

B-3.1 Preparation of Test Samples

B-3.1.1 Draw with an appropriate sampling instrument a small portion of the material from different parts of each container selected. The total quantity of the material drawn from each container shall be sufficient to conduct the tests for all the characteristics given under 2 and shall not exceed 1 kg.

B-3.1.2 Thoroughly mix all portions of the material drawn from the same container. Out of these portions a small but equal quantity shall be taken from each selected container and shall be well mixed up together so as to form a composite sample weighing not less than 100 g. This composite sample shall be divided into three equal parts, one for the purchaser, second for the supplier and the third to be used as referee sample.

B-3.1.3 The remaining portions of the material from each container (after a small quantity needed for the formation of composite sample has been taken) shall be divided into three parts, each part weighing not less than 100 g. These parts shall be immediately transferred to thoroughly dried bottles which are than sealed air-tight with stoppers and labelled with all the particulars of sampling given under **B-1.4.** The material in each such sealed bottle shall constitute an individual test sample. These individual samples shall be separated into three identical sets of samples in such a way that each set has an individual test sample representing each container selected. One of these sets shall be sent to the purchaser, another to the supplier and the third shall be used as referee sample.

B-3.2 Referee Sample — The referee sample shall consist of the composite sample (*see* **B-3.1.2**) and a set of individual samples (*see* **B-3.1.3**) marked for this purposes. It shall also bear the seals of the purchaser and the supplier. These shall be kept at a place agreed to between the purchaser and the supplier and shall be used in case of dispute between the two.

B-4. NUMBER OF TESTS

B-4.1 Tests for the determination of copper carbonate shall be conducted on each of the individual samples.

B-4.2 Tests for the reamining characteristics shall be performed on the composite sample.

B-5. CRITERIA FOR CONFORMITY

B-5.1 For Individual Samples

B-5.1.1 *For Copper Carbonate* — The test results for copper carbonate shall be recorded and the mean and the range for these test results shall be calculated as follows:

Mean ($\bar{X}$) = sum of the test results divided by the number of test results,

Range (R) = The difference between the maximum and the minimum values of the test results.

The value of expression ($\bar{X} \pm 0{\cdot}6\,R$) shall be calculated. If the values of this expression lie within the limits specified in Table 1, the lot shall be declared to have satisfied the requirements for this characteristic.

B-5.2 For Composite Sample — The test results on the composite sample shall meet the corresponding requirements specified in Table 1.

B-5.3 A lot shall be declared as conforming to the specification if it satisfied the requirements for each of the characteristics listed in Table 1.